

RoHS Compliant Product
A suffix of "-C" specifies halogen & lead-free

FEATURES

- High Voltage Application
- Telephone Application

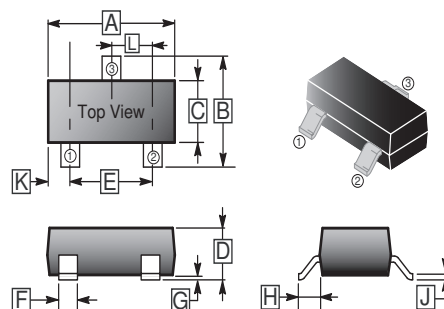
MARKING

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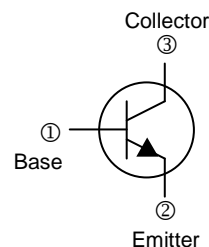
PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-23	3K	7 inch

SOT-23



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.70	3.10	G	0.09	0.18
B	2.10	2.65	H	0.35	0.65
C	1.20	1.40	J	0.08	0.20
D	0.89	1.17	K	0.6 REF.	
E	1.78	2.04	L	0.95 BSC.	
F	0.30	0.50			



ABSOLUTE MAXIMUM RATINGS (T_A=25°C unless otherwise specified)

Parameter	Symbol	Rating	Unit
Collector-Base Voltage	V _{CBO}	350	V
Collector-Emitter Voltage	V _{CEO}	350	V
Emitter-Base Voltage	V _{EBO}	5	V
Collector Current-Continuous	I _C	500	mA
Base Current	I _B	250	mA
Total Device Dissipation ¹	P _D	T _A =25°C	225
		Derate above 25°C	1.8
Thermal Resistance from Junction to Ambient ¹	R _{θJA}	556	°C/ W
Total Device Dissipation ²	P _D	T _A =25°C	300
		Derate above 25°C	2.4
Thermal Resistance from Junction to Ambient ²	R _{θJA}	417	°C/ W
Junction and Storage Temperature	T _J , T _{STG}	-55~150	°C

Notes:

1. FR-5 board : 1 × 0.75 × 0.062 inch.
2. Alumina substrate : 0.4 × 0.3 × 0.024 inch, 99.5% alumina.

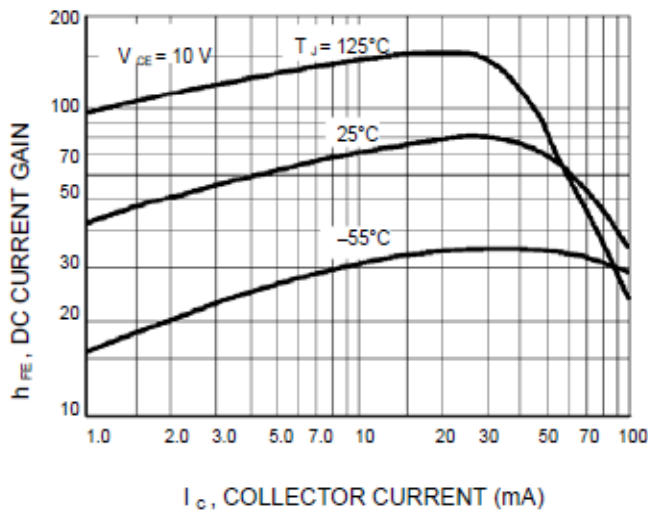
ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Off Characteristics						
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	350	-	-	V	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	350	-	-	V	$I_C=1\text{mA}$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	6	-	-	V	$I_E=10\mu\text{A}$
Collector Cutoff Current	I_{CBO}	-	-	50	nA	$V_{CB}=250\text{V}$
Emitter Cutoff Current	I_{EBO}	-	-	50	nA	$V_{EB}=5\text{V}$
On Characteristics						
DC Current Gain	h_{FE}	20	-	-	V	$V_{CE}=10\text{V}, I_C=1\text{mA}$
		30	-	-		$V_{CE}=10\text{V}, I_C=10\text{mA}$
		30	-	200		$V_{CE}=10\text{V}, I_C=30\text{mA}$
		20	-	200		$V_{CE}=10\text{V}, I_C=50\text{mA}$
		15	-	-		$V_{CE}=10\text{V}, I_C=100\text{mA}$
Collector-Emitter Saturation Voltage ¹	$V_{CE(sat)}$	-	-	0.3	V	$I_C=10\text{mA}, I_B=1\text{mA}$
		-	-	0.35		$I_C=20\text{mA}, I_B=2\text{mA}$
		-	-	0.5		$I_C=30\text{mA}, I_B=3\text{mA}$
		-	-	1		$I_C=50\text{mA}, I_B=5\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	-	-	0.75	V	$I_C=10\text{mA}, I_B=1\text{mA}$
		-	-	0.85		$I_C=20\text{mA}, I_B=2\text{mA}$
		-	-	0.9		$I_C=30\text{mA}, I_B=3\text{mA}$
Base-Emitter on Voltage	$V_{BE(on)}$	-	-	2	V	$I_C=100\text{mA}, V_{CE}=10\text{V}$
Small-Signal Characteristics						
Transition Frequency	f_T	40	-	200	MHz	$V_{CE}=20\text{V}, I_C=10\text{mA}, f=20\text{MHz}$
Collector-Base Capacitance	C_{cb}	-	6	-	pF	$V_{CB}=20\text{V}, f=1\text{MHz}$
Emitter-Base Capacitance	C_{eb}	-	80	-	pF	$V_{EB}=0.5\text{V}, f=1\text{MHz}$

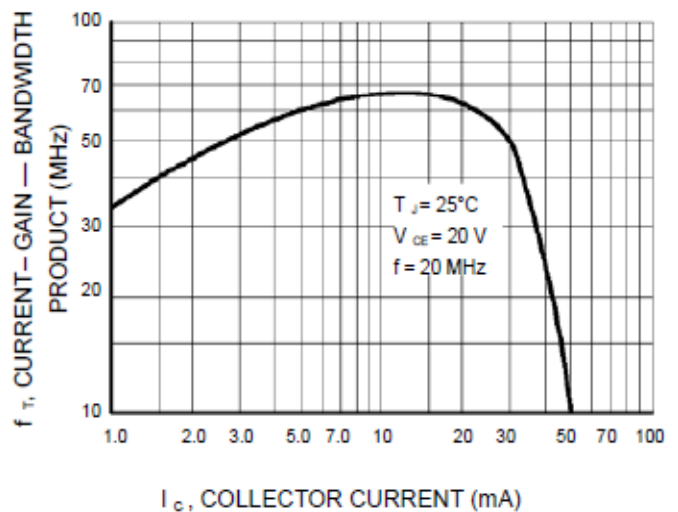
Notes:

1. Pulse test : Pulse width=300 μs , duty cycle=2%.

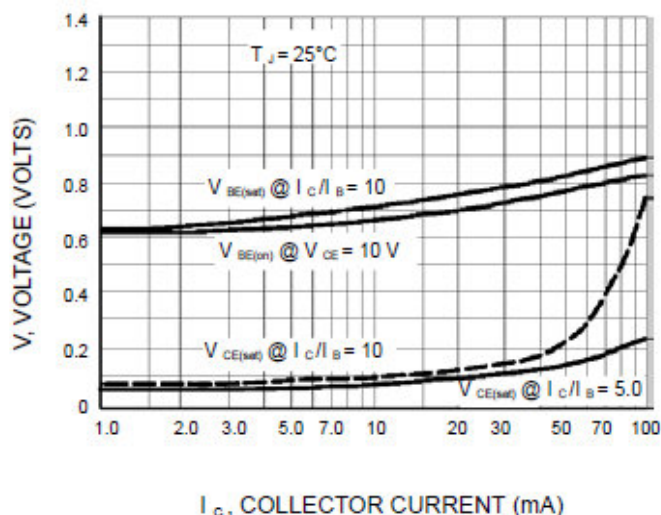
CHARACTERISTIC CURVES



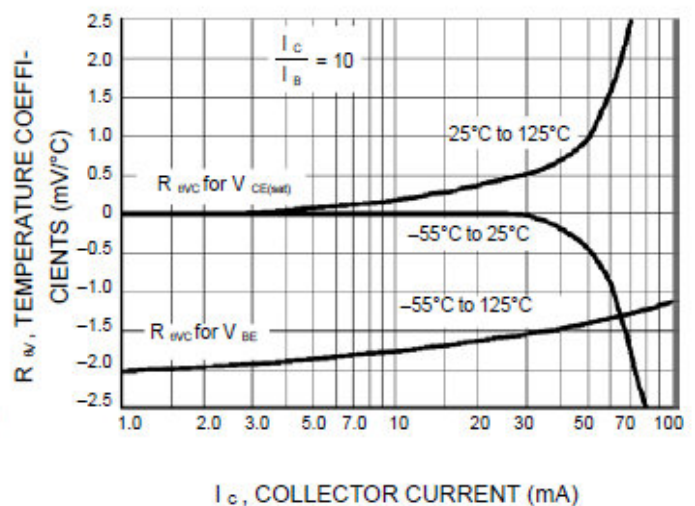
I_C , COLLECTOR CURRENT (mA)
Figure 1. DC Current Gain



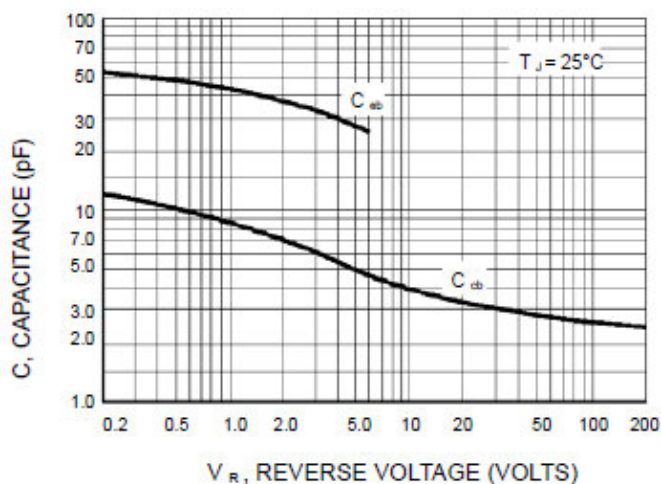
I_C , COLLECTOR CURRENT (mA)
Figure 2. Current-Gain — Bandwidth Product



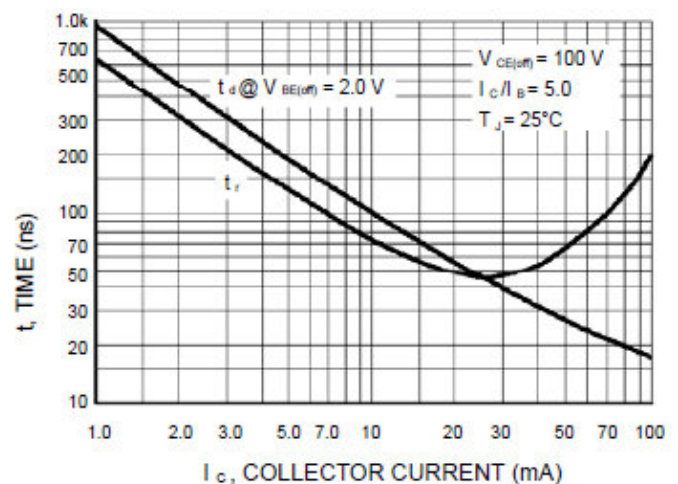
I_C , COLLECTOR CURRENT (mA)
Figure 3. "On" Voltages



I_C , COLLECTOR CURRENT (mA)
Figure 4. Temperature Coefficients

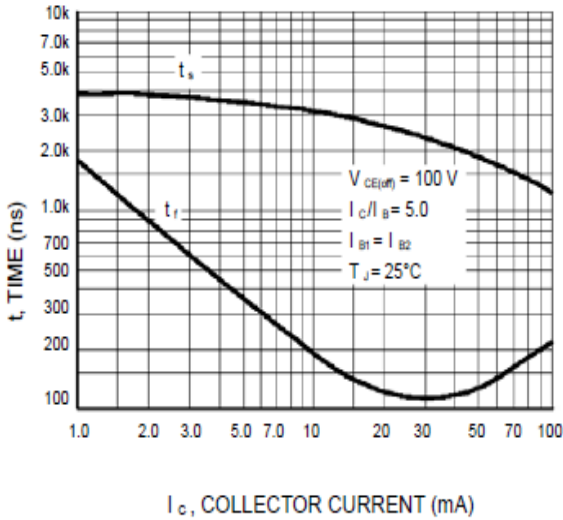


V_R , REVERSE VOLTAGE (VOLTS)
Figure 5. Capacitance



I_C , COLLECTOR CURRENT (mA)
Figure 6. Turn-On Time

CHARACTERISTIC CURVES



I_c , COLLECTOR CURRENT (mA)
Figure 7. Turn-Off Time

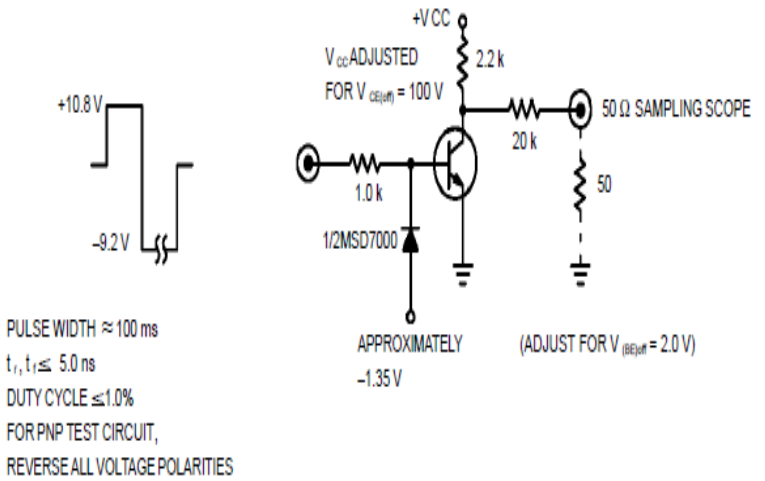


Figure 8. Switching Time Test Circuit

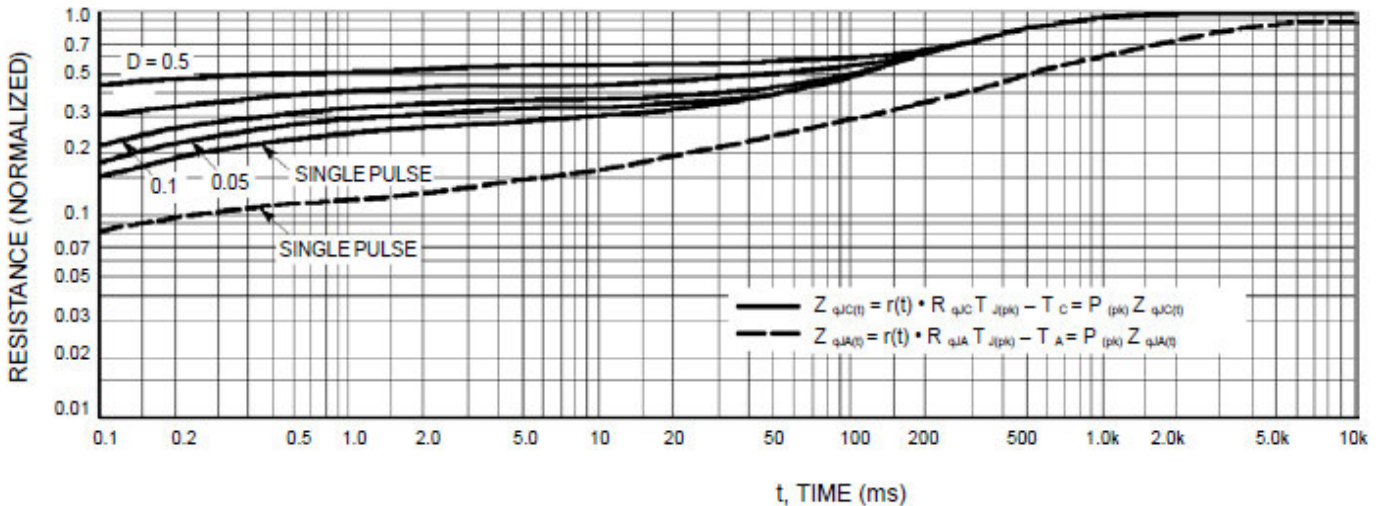
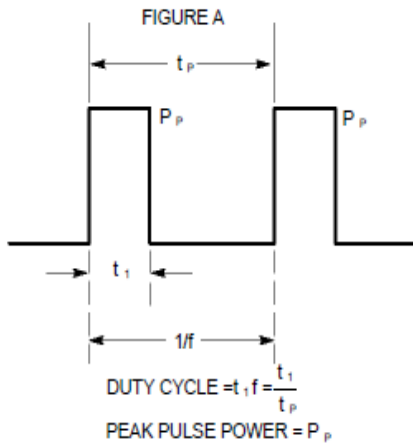


Figure 9. Thermal Response



Design Note: Use of Transient Thermal Resistance Data